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CLAIM:

1. A method for improving the system response of a photodetector array based spectrometer having a main light source with a primary spectral output, comprising the steps of:
- 5 (i) determining a system response curve for said spectrometer over said spectrometer's operating spectral range;
- (ii) identifying at least one spectral band at which the system response curve falls below a predetermined value; and
- 10 (iii) adding at least one secondary light source with a secondary spectral output complementary to said at least one spectral band identified in step (ii) so as to produce a combined spectral output which provides a modified system response curve which is at or above said predetermined value at said spectral band.
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2. The method claimed in claim 1, further comprising the step of filtering said combined spectral output so as to reduce peaks in said system response curve.
- 20 3. The method claimed in claim 2, further comprising the step of masking said photodetector array so as to equalize said system response curve.
4. A light source for a photodetector array based spectrometer, said light source comprising a primary light source producing a primary spectral output which results in a characteristic system response curve, said light source further including at least one secondary light source
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producing a secondary spectral output which combines with said primary spectral output, whereby, said combined spectral output results in a more uniform system response curve that is flatter than the system response curve obtained when a primary light source alone is used.

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5. The light source claimed in claim 4, wherein, the secondary light source is a broadband light source having a shaping filter.

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6. The light source claimed in claim 4, wherein, the secondary light source is a narrow band light source.

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7. The light source claimed in claim 6, wherein, said narrow band light source is selected from the group consisting of a narrow band fluorescent light source, a light emitting diode, and a laser.

8. The light source claimed in claim 4, wherein, multiple light sources are combined by means of multiple branches of fibre optic bundles.